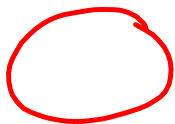

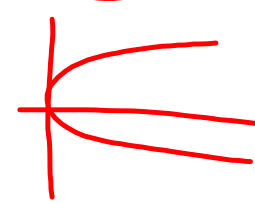




Warm Up - Functions!

Graph the following on desmos and discuss with a partner what makes a function?

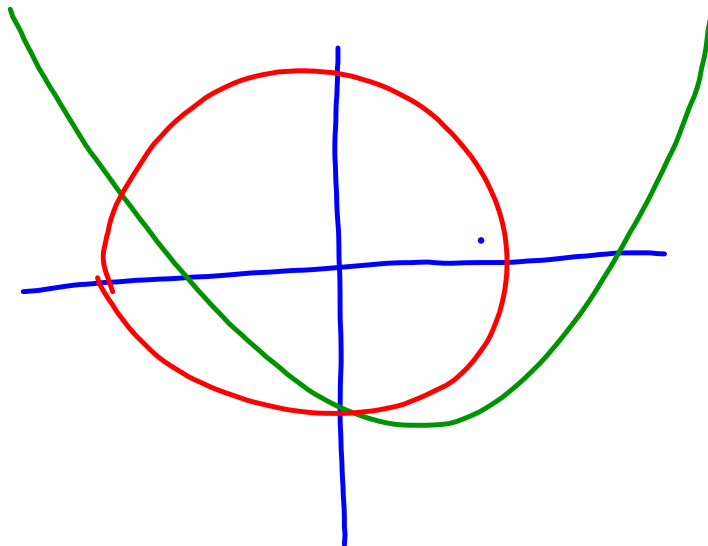
Functions	Not Functions
$y=4x+8$ <i>line</i>	$x^2+y^2=9$ 
$y=x^2-4$ 	$y^2=x$ 
$y=x^3+9$ 	
$y=1/x$ 	

How do we know if something is a function?

For every input, there is only one output.
for every x , there is 1 y .

Vertical Line Test (VLT)

- if the relation touches a vertical line ONCE \rightarrow function
- if touches TWICE or more \rightarrow NOT a function



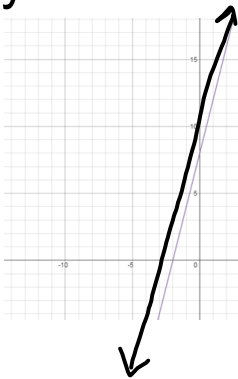
For a Function, we have to be able to state the
DOMAIN and RANGE

Domain - the set of values that x is "allowed" to be

Range - the set of values that y is "allowed" to be

Let's look back to a few examples

$$y=4x+8$$



what is x allowed to be?

Anything!

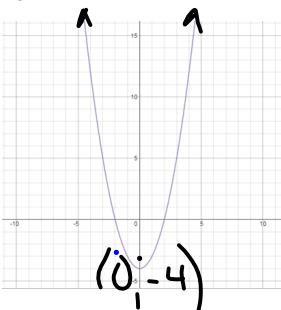
$$D: \{x | x \in \mathbb{R}\}$$

Domain:

what is y allowed to be? $\{x \text{ such that } x \text{ is an element of the real numbers}\}$

$$R: \{y | y \in \mathbb{R}\}$$

$$y=x^2-4$$



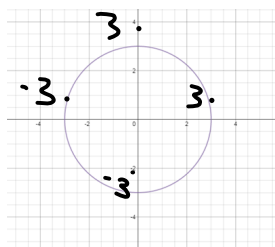
what is x allowed to be? Anything!

$$D: \{x | x \in \mathbb{R}\}$$

what is y allowed to be? bigger or equal to -4

$$R: \{y | y \geq -4, y \in \mathbb{R}\}$$

$$x^2+y^2=9$$



Domain

what is x allowed to be?

-3 to 3

$$D: \{x | -3 \leq x \leq 3, x \in \mathbb{R}\}$$

Range

$$R: \{y | -3 \leq y \leq 3, y \in \mathbb{R}\}$$

Homework - Domain and Range Worksheet

Function Notation!!!!

$$y=4x+8$$

What letter is the equation made up of? x

How would we make a table of values?

pick a value for x and sub it in.

x	y
4	$4(4)+8=24$
30	$4(30)+8=128$
128	$4(128)+8=520$

let's write this another way....

$$y(x) = 4x + 8$$

" y of x "

$$y(4) = 4(4) + 8 = 24$$

" y of 4"

SUMMARY

Equation Notation

Function Notation

$$y = 3x$$

$$y(x) = 3x$$

$$h = t^2 - 9$$

$$h(t) = t^2 - 9$$

$$f = x^2 + 5x + 6$$

$$f(x) = x^2 + 5x + 6$$

Try this out...

$$f(x) = x + 9$$

what is $f(1)$? $f(2)$? $f(-3)$, $f(-4)$

$$f(1) = 1 + 9 = 10 \quad \therefore (1, 10) \text{ as a point}$$

$$f(2) = 2 + 9 = 11 \quad \therefore (2, 11) \text{ is a point}$$

$$f(-3) = -3 + 9 = 6 \quad \therefore (-3, 6) \text{ is a point}$$

$$f(-4) = -4 + 9 = 5 \quad \therefore (-4, 5)$$

$$j(x) = x^2$$

what is $j(1)$? $j(3)$? $j(-8)$? $j(-2)$? $j(0)$?

$$j(1) = 1^2 = 1$$

$$j(3) = 3^2 = 9$$

$$j(-8) = (-8)^2 = 64$$

$$j(-2) = (-2)^2 = 4$$

On your Own...

1) $g(x) = 4x + 3$, find $g(0)$, $g(1)$, $g(10)$, $g(-10)$

2) $h(t) = 6t$, find $h(-3)$, $h(-1)$, $h(0)$, $h(2)$, $h(3)$

3) $p(w) = 3w^2$, find $p(0)$, $p(9)$, $p(1)$, $p(0.5)$

Trickster...

4) If $g(x) = 2x$ and $h(x) = -3x + 4$, find $g(1) + h(2)$

5) If $y(x) = 3x - 1$ and $m(x) = 2x^2$, find $y(2) * m(3)$

6) If $r(x) = 4x^2 + 5x - 6$ and $n(x) = 3$, find $r(1) + n(2)$